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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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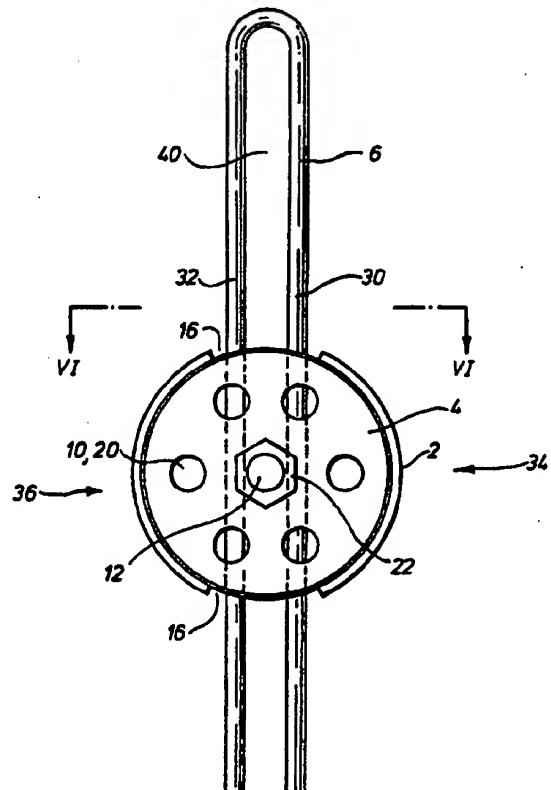
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## (54) Title: SECUREMENT DEVICE AND METHOD

## (57) Abstract

A securement device comprises a base (2) arranged to receive a top (4) so that a length of wire (6) can be clamped therebetween in order to define a looped configuration. Clamping of the base and top is achieved by means of a threaded stud or bolt fixed relative to the base which is received within a nut fixed relative to the top. Release of the top from the base is restricted by a lock which extends through aligned openings (10, 20) in the base and top. In use, the length of wire (6) may be wrapped around an operating member of a valve and secured in position using the device.



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SECUREMENT DEVICE AND METHOD

This invention relates to a securement device and a method and particularly, although not exclusively, relates

5 to a securement device for and a method of securing an elongate flexible member in a looped configuration. The device and method may be used for locking a valve in a closed or open position.

10 In chemical plants or on oil or gas rigs, it is often necessary to secure fluid control valves in closed or open positions thereby preventing them from being inadvertently moved.

15 One way of securing a valve in an open or closed position comprises extending a chain around the valve housing and an operating member of the valve and then securing the chain in position by means of a padlock. However, chains are difficult to store without becoming  
20 tangled and, due to their heaviness, it is difficult for an operator to carry a large number of chains when it is desired to secure a number of valves. Also, large valves may need to be secured by more than one chain and, therefore, chains must be secured together which adds to  
25 the difficulties. Additionally, padlocks are expensive and can be severely affected by hostile environments. Furthermore, keys to padlocks can be lost in which case the chain secured thereby must be cut through to release the valve. In this event, the chain cannot be re-used.

30 It is also known to use plastic or wire "tie wraps" to secure valves in position. Such tie wraps comprise an elongate length of serrated plastic or wire which has a securement element in which an opening is defined at one end. The securement element includes ratchet teeth which

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are arranged such that, when the free end of the length of plastic/wire is pushed into the opening, it can be extended further thereinto but not released therefrom. Thus, the wrap can be tightened around a valve but cannot

5. be released. Therefore, it must be cut to release and it cannot be re-used.

It is an object of the present invention to address problems associated with known securement devices and

10 methods

According to the invention, there is provided a method of securing an elongate flexible member in a looped configuration, the method comprising clamping juxtaposed portions of the flexible member in order to fix their relative positions.

Preferably, the method is for securing an elongate flexible member in position to secure a valve in a desired position, for example a closed or open position. The elongate flexible member may be arranged to be wrapped around a valve for securing it in the desired position.

Said elongate flexible member is preferably arranged to be stored in a coiled state, for example by being provided on a roll or spool. In the method, a length of flexible member may be removed from the roll or spool, detached from the remainder on the roll or spool and arranged in position around a valve. Said elongate flexible member may be made out of plastics or metal. Most preferably it is made of metal. For example, it may be steel wire.

The method preferably uses a securement device which is arranged to be releasably secured to the flexible

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member. The method may includ the step of ngaging the device with the flexible member so that the device is slidable along the flexible member, for example the flexible member may extend within an opening in the 5 device; positioning the device in a desired position along the flexible member; and securing the device in order to fix its position relative to the flexible member.

The device preferably includes an opening which opens 10 in a first direction. In the method, the flexible member is preferably engaged with the device by moving the flexible member in a direction laterally to the first direction. In the method, a first part of said flexible member is preferably moved in an opposite direction to a 15 second part of said flexible member but both parts are preferably moved laterally as described.

The invention extends to a securement device for securing an elongate flexible member in a looped 20 configuration, the device including first and second clamp members that are movable relative to one another for applying a clamping force to the flexible member for securing it in position.

25 The device is preferably for use in the method described herein.

The device is preferably arranged to releasably 30 secure an elongate flexible member in a looped configuration. The device is preferably arranged to secure first and second parts of the flexible member in position; preferably in a position wherein the parts extend substantially parallel to one another and are preferably laterally spaced apart.

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The device is preferably arranged to apply an adjustable clamping force to the flexible members.

Preferably, the first clamp member and the second  
5 clamp member are together arranged to define an opening arranged to receive the flexible member. Preferably, the device includes first and second openings which are preferably arranged on opposite sides of a centre of the device. In one embodiment, said first and second openings  
10 are diametrically spaced apart. Preferably, the first member includes the or each said opening, for example one or more slots and said second member is arranged to close the opening(s).

15 Said first clamp member preferably includes an opening for receiving said second clamp member.

Said first and second members are preferably securable to one another, for example by co-operable male  
20 and female parts. Said co-operable parts preferably comprise a screw-threaded shaft arranged to co-operate with an internally screw-threaded part. Said first member preferably includes said male part. In one embodiment, said male part may comprise a stud. In another embodiment,  
25 said male part may comprise a bolt. Means is preferably provided for restricting rotation of the bolt relative to other parts of said first member. Preferably, a head of said bolt may be restricted from rotation by being received in an opening having a diameter which is less  
30 than the maximum diameter of the head. For example, the head may be hexagonal and it may be received in a hexagonal opening.

35 Said first and second members preferably include alignable openings through which a locking part of a lock

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may be extended for locking the first and second parts to one another.

Tamper evident seal means may be provided and  
5 arranged to indicate if the first and second parts have been released. Said tamper evident seal means may be arranged to be associated with aligned openings of said first and second parts.

10 The invention extends to an assembly which comprises a securement device as described above securing an elongate flexible member in a looped configuration.

15 The elongate flexible member of the assembly is preferably secured to a valve for securing it in a closed or open position.

20 Specific embodiments of the invention will now be described, by way of example, with reference to the accompanying diagrammatic drawings, in which:

Figure 1 is a perspective view of a base of a securement device;

25 Figure 2 is a top plan view of the base of figure 1;

Figure 3 is a perspective view of a top of the securement device;

30 Figure 4 is a top plan view of the top of figure 3;

Figure 5 is a top plan view of the securement device, in use;

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Figure 6 is a cross-section along line VI - VI of figure 5;

5. Figure 7 is a perspective view of a top of an alternative securement device;

Figure 8 is a perspective view from above of a bottom of the alternative securement device;

10 Figure 9 is a perspective view from below of the bottom of the alternative securement device together with a bolt; and

15 Figure 10 is a vertical cross-section through the device of figure 9.

In the figures, the same or similar parts are annotated with the same reference numerals.

20 The securement device comprises a base 2 and a top 4 that are arranged to be releasably secured together for securing a length of wire 6 in a looped configuration.

25 The base 2 of the securement device includes a circular cross-section planar part 8 in which diametrically spaced apertures 10 are defined. A threaded shaft 12 extends upwardly from the centre of planar part 8. Arcuate wall sections 14 extend upwardly from the planar part 8 and are arranged to define diametrically spaced apart openings 16.

30 The top 4 of the securement device comprises a circular cross-section planar part 18 in which apertures 20 are defined. A nut 22 is secured to the centre of an

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upper wall of the planar part 18 around a circular opening therein.

5       The top 2 and base 4 of the securement device are arranged so that the nut 22 can be engaged with and screwed down the shaft 12 so that the planar part 18 of the top can fit snugly within the base 2, between its walls 14.

10       The device may be used as follows:

15       Initially, a length of steel wire is wrapped around a valve in order to secure it in an open or closed position, as desired. Then, with the top 2 and base 4 of the securement device loosely secured together by means of nut 22 engaging threaded shaft 12, the legs 30, 32 of wire 6 are engaged with the device, by moving the legs in the direction of respective arrows 34, 36 through a gap defined between the top 2 and base 4, until the legs 30, 20 32 are received in openings 16 on opposite sides of the shaft 22. Next, the device may be slid along the wire to adjust the size of loop 40 as may be required to tighten the wire around the valve. When suitably arranged, the nut 2 may be rotated so as to move top 2 down the shaft 12, 25 thereby to clamp the legs 30, 32 of wire securely between respective planar parts 8 and 18 of the base 2 and top 4.

30       The base 2 and top 4 may be locked in position by aligning selected openings 20 in the top with openings 10 in the base and then engaging a padlock with one or both pairs of aligned openings. Alternatively, or additionally, a security seal may be arranged within aligned openings so that any tampering with the device, for example, any attempt to release the device, will be evident.

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The device may easily be released by an authorised person so as to allow the wire to be re-used.

It should be noted that the wire 6 is easily engaged with the device by moving legs 30, 32 laterally to the diameter which extend through the openings 8. Ends of the wire need not be threaded through any openings and, therefore, there is no detriment in the event that the free ends of the wire are frayed or otherwise deformed.

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It should also be noted that use of the device is relatively easy. An operator can simply be provided with a roll of steel wire, a number of devices and a means for cutting the wire. There is little likelihood of the wire becoming tangled or otherwise rendered difficult to use.

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In one embodiment, an operator may position a tag over the shaft 12 prior to engagement with the top 4. The tag may carry important information relating to the use of the valve. Thus, the device may provide a convenient way of securing such a tag in position.

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The alternative securement device shown in figures 7 to 10 comprises a top 50 which is similar to the top 4 of figures 3 and 4, except that it includes additional apertures 20, and a base 51. The base 51 includes a hexagonal cross-section downwardly open housing 52 which surrounds a circular opening 54 in wall 56 of the base. The housing 52 is arranged to receive a standard M8 bolt 58 so that head 60 of the bolt is snugly received in the housing and cannot be rotated therewithin. The bolt 58 is held in position by means of a star-clip which is seated in a recess 62 defined in wall 56. Shank 60 of the bolt 58 extends away from wall 56 of the base and is co-operable with nut 22 on the top 50.

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Wall 62 of the base includes aligned pairs of openings 64, 66 between which 3mm wide parallel semi-circular cross-section grooves 68 are defined in wall 56. The openings and grooves are arranged to receive 5 respective legs of wire. Advantageously, the grooves 68 are ridged (or otherwise provided with non-smooth friction surfaces) for aiding the securement of the wire in position.

10 The device of figures 7 to 10 is used generally as described above for the figures 1 to 6 embodiment.

15 The devices may be manufactured out of plastics or metal or a combination of both. In any event, the devices can be cheaply manufactured and in combination with cheap and readily available steel wire, provides a cheap means of securing valves or any other similar components in a desired configuration.

20 The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and 25 documents are incorporated herein by reference.

30 All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

35 Each feature disclosed in this specification (including any accompanying claims, abstract and

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drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of  
5. a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features  
10 disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

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CLAIMS

1. A method of securing an elongate flexible member in a looped configuration, the method comprising clamping juxtaposed portions of the flexible member in order to fix their relative positions.
2. A method according to Claim 1, for securing an elongate flexible member in position to secure a valve in  
10 a desired position.
3. A method according to Claim 1 or Claim 2, wherein the elongate flexible member is arranged to be wrapped around a valve for securing it in the desired position.
- 15 4. A method according to any preceding claim, including the step of engaging a securement device with the flexible member so that the securement device is slidable along the flexible member; positioning the securement device in a desired position along the flexible member; and securing the securement device in order to fix its position relative to the flexible member.
- 25 5. A securement device for securing an elongate flexible member in a looped configuration, the device including first and second clamp members that are movable relative to one another for applying a clamping force to the flexible member for securing it in position.
- 30 6. A device according to Claim 5, which is arranged to secure first and second parts of the flexible member in position.
- 35 7. A device according to Claim 5 or Claim 6, wherein the first clamp member and the second clamp member are

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together arranged to define an opening arranged to receive the flexible member.

8. A device according to any of Claims 5 to 7, wherein  
5 said first and second members are securable to one another by co-operable male and female parts.

9. A device according to any of Claims 5 to 8, wherein  
10 said first and second members include alignable openings through which a locking part of a lock may be extended for locking the first and second members to one another.

10. A device according to any of Claims 5 to 9, wherein  
15 tamper evident seal means is arranged to indicate if the first and second members have been released.

11. An assembly which comprises a securement device according to any of Claims 5 to 10 securing an elongate flexible member in a looped configuration.

20 12. An assembly according to Claim 11, wherein said elongate flexible member of the assembly is secured to a valve for securing it in a closed or open position.

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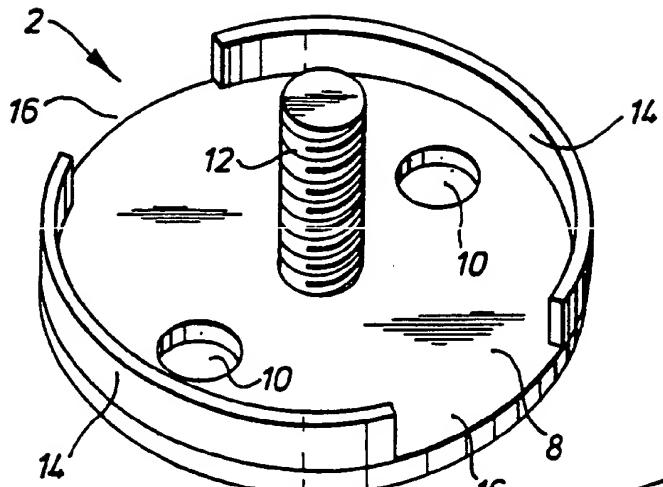


Fig.1.

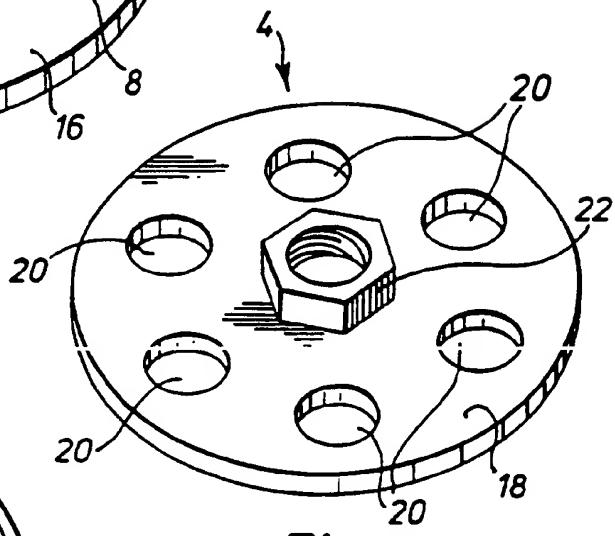


Fig.3.

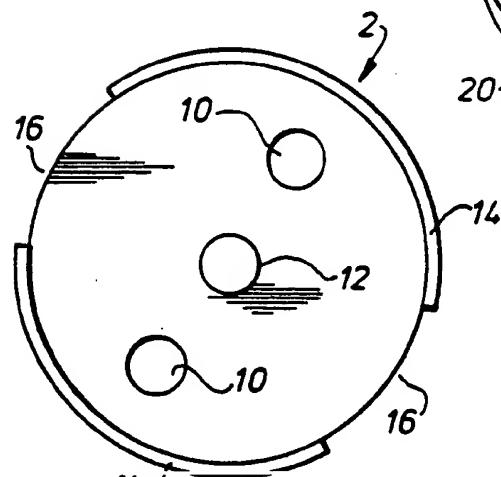


Fig.2.

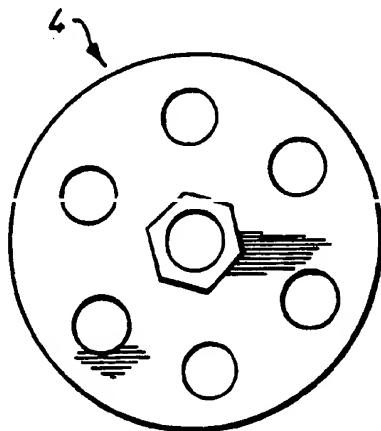


Fig.4.

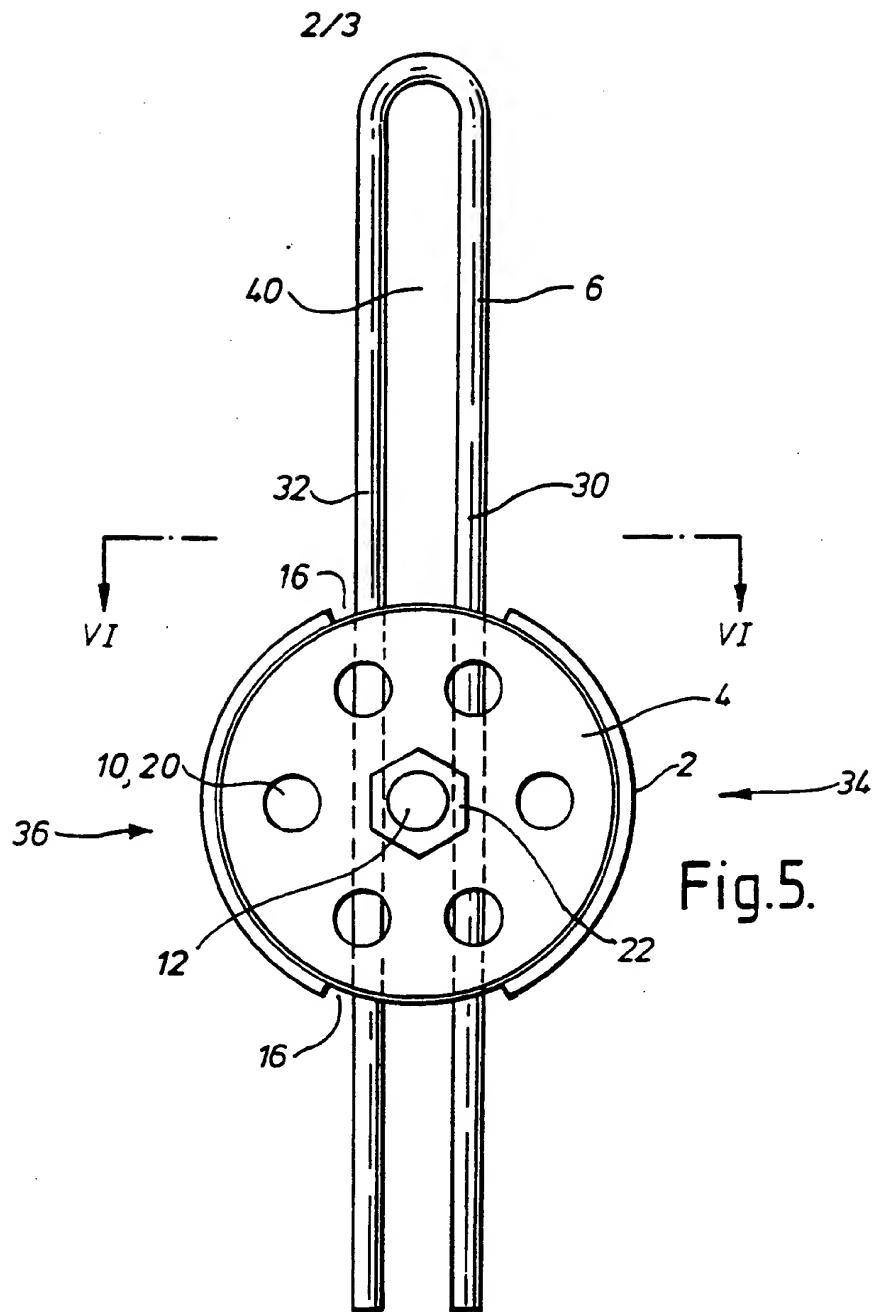
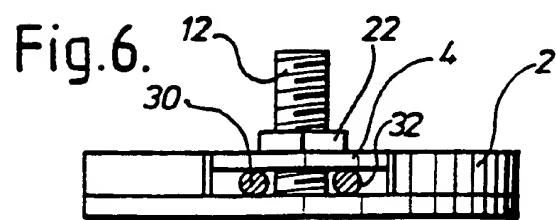


Fig.5.



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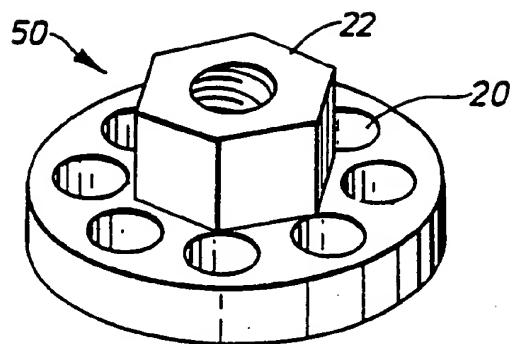


Fig. 7.

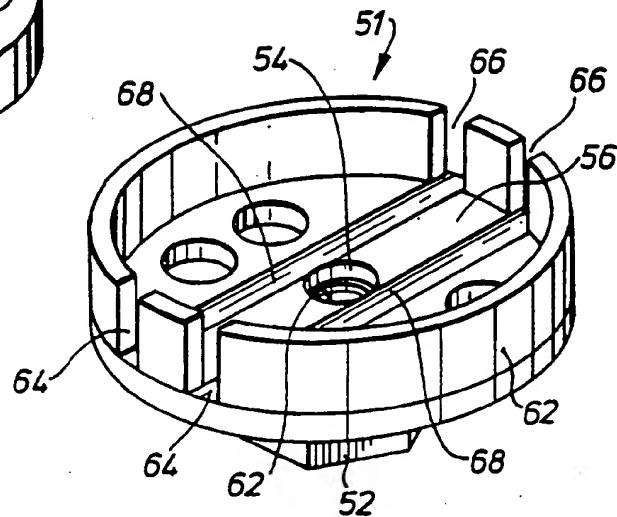


Fig. 8.

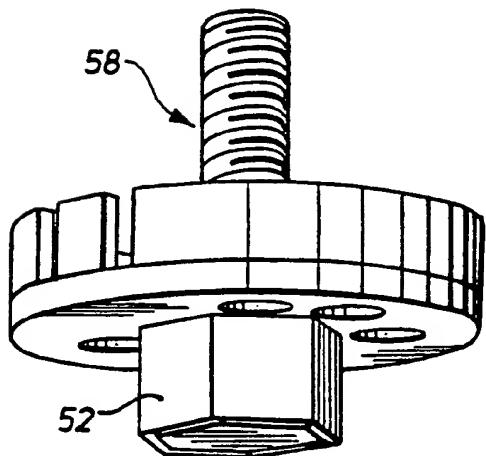


Fig. 9.

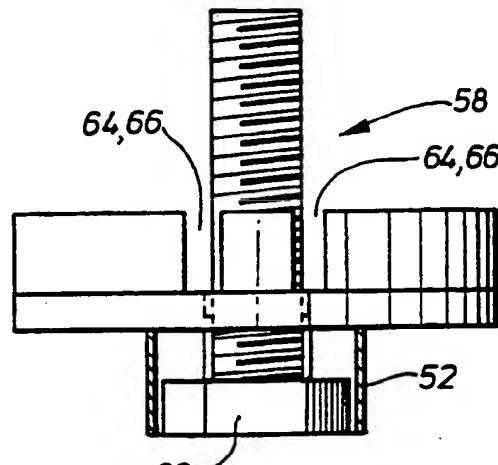


Fig. 10.

# INTERNATIONAL SEARCH REPORT

Int'l Application No  
PCT/GB 96/01723

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 F16G11/14 F16K35/06

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 F16K F16G F16B F16L F21V

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE,A,31 07 433 (HUCK MANFRED) 16 September 1982	1,5-8,11
Y	see page 6, paragraph 2 see claims 1-3,7 see figures 1,2	3,9,12
Y	FR,A,2 528 938 (PEREIRA MANUEL) 23 December 1983 see page 1, paragraph 1 see page 2, line 12 - line 35 see page 3, line 4 - line 14 see claims 1,4 see figure 1	3,9,12
A	DE,U,94 01 703 (MACRIFIN S P A) 19 May 1994 see page 6, line 23 - page 7, line 12	10
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Date of the actual completion of the international search  10 October 1996	Date of mailing of the international search report  24.10.96
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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE,A,34 37 089 (CULLMANN HANDEL) 17 April 1986 ---	
A	EP,A,0 347 289 (MECAFRANCE SA) 20 December 1989 -----	

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International Application No  
PCT/GB 96/01723

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FR-A-2528938	23-12-83	NONE	
DE-U-9401703	19-05-94	NONE	
DE-A-3437089	17-04-86	NONE	
EP-A-0347289	20-12-89	FR-A- 2633028	22-12-89